MOHAMMAD JAHIRUL ALAM

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ANALYTICAL AND ATMOSPHERIC CHEMISTRY RESEARCHER

Chemist with a high instrumental knowledge and > 5 years of analytical research with instrument troubleshooting experience. Broad expertise in Chromatography, Method development and Data analysis workflow. As a highly skilled chemist with extensive experience in applying industrial and analytical instruments, I have developed a vast background in academic research in analytical chemistry, including post-run analysis and data analysis. With expertise in Matlab, PMF and R programs, I am also well-equipped to work with complex data sets and craft comprehensive laboratory reports.

CORE COMPETENCIES

Liquid Chromatography LC, HPLC, UPLC	Gas Chromatography - GC, GC/GC (multidimensional GC)	
Mass Spectrometry- EI, ESI, DESI-MS, MS/MS	Flame ionization detector- FID	Thermal Analysis- TD-30, DSC
Inductively Coupled Plasma (ICP Spectro Genesis)	Fourier Transform Infrared (OilExpress 4)	Particulate matter samplers
Atomic Absorption Spectrophotometer (AAS)	Anton Paar Viscometer	Metrohm total number of acid (TAN)
Metrohm total number of base (TBN)	Metrohm Water content	METLER Karl Fisher instrument
Aethalometer	AERONET	

Languages & OS: UNIX, Linux, Mac, Windows, R, Python

Software Applications & Development Platforms: Microsoft Office Suite (Excel, Word, PowerPoint, Visio, Project, OneNote), Laboratory Information Management System (LIMS), OpenLab, NIST library, Shimadzu Lab Solutions, GC image, MATLAB, SharePoint, ArcGIS.

EDUCATION

Ph.D. Candidate in Atmospheric Science from the University of Houston   **2021 – 2025**
- Graduate Tuition Fellowship (GTF), University of Houston, 2021
- Outstanding Academic Achievement Award in Atmospheric Science, University of Houston, 2022
- AMS Conference Travel Funding – Presentation in Baltimore, Maryland, 2024
- Travel award for 19th International GC×GC Symposium, May 29-June2, 2022, Canada
- **Dissertation Title**: *Per- and polyfluoroalkyl substances (PFAS) in air, water, and soil and their impact on air quality* Experienced and working with Methods EPA 533, EPA 537.1, EPA 1633, and Other Test Method 45 (OTM-45), air, process soil and water samples to detect various small molecule contaminants, perfluorinated compound PFAS, volatile solvents under NELAC and EPA regulations.

Master of Science (M.S.) in Physical Chemistry from the University of Dhaka, Dhaka, Bangladesh   **2016 – 2018**
- International Conference on Chemical Science & technology, 24-25 Feb, 2018. Department of Chemistry, KUET, Bangladesh (Poster presentation: Computational Structure analysis of Hydrated Nickel Ion Ligand)
- **Thesis Title**: *Computational investigation of hydrated Nickel ion ligand complexes, (Ligand: H_2O, NH_3, -OH, $-Cl^-$)*

Bachelor of Science (B.S.) in Chemistry from the University of Dhaka, Dhaka, Bangladesh   **2012 – 2016**
- **Thesis Title**: *Adsorptive removal of ethyl violet from aqueous solution using banana stem powder*

CARRIER HIGHLIGHTS

Research Assistant & Teaching Assistant – University of Houston, Houston TX , USA   **Dec 2025**
- Efficiently prepared, analyzed, and performed monthly **120** samples analysis following EPA, ASTM, TO methodologies
- Developed and validated a new method for petroleum oil on the multidimensional GC, resulting in a **40%** reduction in analysis time with **99%** accuracy
- Measured volatile organic compounds (VOCs) by using GC, acquired around 8 thousand data, and found source apportion model of VOCs of Mexico City (2016) by using the Positive Matrix Factorization Model PMF 5.0 and doing data analysis using R programming ArcGIS, and HYSPLIT
- Trained and monitored four colleague researchers, leading to an increase in the utilization of instruments by **30%**
- Graduate Lab Manager and graduate student mentor in Meteorology Laboratory, Atmospheric Chemistry Laboratory, and Climate Change Laboratory. Taught instrumentation/calibration techniques, managed **$320K+** in inventory in addition to teaching Meteorology, and Geoscience tutoring
- **Published Article:** Alam, M. J., Rappenglueck, B., Retama, A., & Rivera-Hernández, O. (2024). Investigating the Complexities of VOC Sources in Mexico City in the Years 2016–2022. Atmosphere, 15(2), 179. https://doi.org/10.3390/atmos15020179

Process Improvement Assistant (Co-op experience) – The Viswa Group, Houston, Texas, USA   **Jun 2023 to Aug 2023**
- Achieved monthly cost savings of **$5,000** through a remarkable **23%** reduction in testing time by optimizing methods for LC, GC ICP, FTIR, TAN, Water Content, and Viscosity tests
- Led process improvement initiatives project, resulting in a **20%** revenue increase and **30%** processing time reduction through takt time analysis
- Developed and validated an innovative approach resulting in monthly cost savings of **$4000** for Lube and Crude oil combustion testing

Application Chemist – Shimadzu Corporation, Dhaka, Bangladesh   **Dec 2020 – Jul 2021**
- Developed and validated **15** methods of LC and **10** methods for GC by using appropriate setup and parameters for industrial clients, resulting in a **30%** increase in lab productivity by reducing analysis time
- Improved gas chromatography measurements by **20%** and reduced measurement variability by **15%** through troubleshooting 30 instruments while also increasing customer satisfaction by **30%** by providing technical support and resolving complaints
- Operated Operational Qualifications, Performance Qualifications for 10 analytical instruments (LC & GC) every month; increased completion rate by **200%**
- Conducted analysis of over **200** finished goods and raw materials based on pharmacopeia methods USP, BP, EP, and ISO (ISO 22442, ISO 14001, ISO 14067) standards with less than a **3%** error rate
- Trained 150 clients and 5 colleagues on maintaining and operating various LC/GC models and laboratory procedures, creating **25%** more users

ACTIVITIES

Traveling	Fishing	Baseball